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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.          | CONFIRMATION NO. |
|---|-------------|----------------------|------------------------------|------------------|
| 10/555,475  | 11/02/2005  | Morio Sugita         | MAT-8762US                   | 4062             |
| 52473   | 7590        | 01/06/2009           |                              |                  |
| RATNERPRESTIA<br>P.O. BOX 980<br>VALLEY FORGE, PA 19482 |             |                      | EXAMINER<br>DRENNAN, BARRY T |                  |
|   |             |                      | ART UNIT                     | PAPER NUMBER     |
|   |             |                      | 4133                         |                  |
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|   |             |                      | 01/06/2009                   | PAPER            |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                      |  |
|------------------------------|--------------------------------------|--------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/555,475 | <b>Applicant(s)</b><br>SUGITA ET AL. |  |
|                              | <b>Examiner</b><br>Barry Drennan     | <b>Art Unit</b><br>4133              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,5,9,11,13,17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5, 9, 11, 13, 17 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment filed by Applicant on 20 November 2008 has been entered. Claims 2, 4, 6-8, 10, 12, and 14-16 are cancelled, and claims 17 and 18 are added. Accordingly, claims 1, 3, 5, 9, 11, 13, and 17-18 are pending in the application.

### ***Response to Arguments***

2. The amended title is satisfactory, and accordingly, the objection to the title is withdrawn.

3. The informalities noted in the specification in the previous Office action were corrected by the amendment and the objection to the specification for these informalities is withdrawn.

4. Claims 9, 11, and 13 were amended, correcting the issue of improper dependent form raised in the previous Office action. The objection to these claims for improper dependent form is withdrawn. The objections to claims 10, 12, and 14-16 are rendered moot by the cancellation of those claims.

5. Claim 1 was amended, correcting the informalities cited in the previous Office action. The objection to this claim for these informalities is withdrawn. The objection to claim 8 is rendered moot by the cancellation of that claim.

6. Claims 1 and 9 were rejected on the ground of non-statutory obviousness-type double patenting in the previous Office action. These claims were amended to include

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limitations not present in the conflicting claims, and accordingly, the rejections of these claims on this basis are withdrawn.

7. Applicant's arguments with respect to claims 1, 3, 5, 9, 11, and 13 have been considered but are moot in view of the new ground(s) of rejection necessitated by Applicant's amendments.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 3, 5, 9, 11, 13, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okano et al. (U.S. Patent 6,144,754, issued 7 November 2000, hereinafter Okano), and further in view of Shimomae et al. (U.S. Patent 5,327,260, issued 5 July 1994, hereinafter Shimomae), Cleveland et al. (U.S. Patent 5,231,674, issued 27 July 1993, hereinafter Cleveland), and Benedetti et al. ("Image Convolution on FPGAs: the Implementation of a Multi-FPGA FIFO Structure," 24<sup>th</sup> Euromicro Conference, Vol. 1 pp. 123-130, published August 1998, hereinafter Benedetti).

10. With respect to claim 1, Okano discloses:

extracting data from an image along a plurality of concentric integrating circles (Fig. 1 #11, #12, col. 3 lines 55 and 64-65, and Fig. 3),

adding the image data extracted along each integrating circle (Fig. 1 #13, col. 4 lines 12-17), and

calculating a difference between added values of two closest concentric integrating circles (Fig. 6, col. 6 line 62 through col. 7 line 8).

While a partial frame memory is disclosed in Okano (Fig. 1 #11), Okano does not disclose the memory including a plurality of line memories of a FIFO type being connected in series. Okano also does not disclose a plurality of drawing lines that extract the image data from the partial frame memory. While Okano discloses adding the image data extracted along each integrating circle, Okano does not expressly disclose using a plurality of adders, each corresponding to an integrating circle, to do so. Okano does not disclose comparing the difference value to a predetermined threshold. While Okano discloses scanning the integrating circles over the image, and performs the integration and differencing every time that the integrating circles are shifted by a position (col. 5 lines 24-25), Okano does not disclose shifting the image through the partial frame memory past the plurality of drawing lines and performing the integration and differencing after each shift.

However, Shimomae discloses a memory storing part of an image frame comprising a plurality of FIFO line memories connected in series (Fig. 6, #72), a plurality of drawing lines that extract image data from the memory (Fig. 6, #73, including the various outgoing lines), and the technique of shifting the image data through the line memories to change the position of a recognition window relative to the image and performing the relevant calculations after the image has been shifted by one pixel (col. 9

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lines 42-48). Shifting image data past the drawing lines performs the same function as Okano's technique of using the integrating circles to reference pixels in the image, but is more amenable to a hardware implementation. While Shimomae's apparatus detects a specific pattern, one of ordinary skill in the art could adapt that apparatus to detect one of the integrating circles disclosed by Okano.

In addition, it would have been known to one of ordinary skill in the art that an adder is the appropriate hardware device for finding the sum of a plurality of values. One of ordinary skill in the art would have also understood that by using more than one adder, more than one sum could be found at the same time by simply replicating the technique shown in Shimomae, Fig. 6, for each pattern to be found (i.e., each of the concentric integrating circles disclosed by Okano), by connecting the drawing lines to the appropriate memory locations.

Finally, Cleveland discloses comparing the difference result to a predetermined threshold value (col. 8 lines 7-26) to find the pupil-iris boundary instead of taking the largest difference result as Okano does.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the pupil-iris boundary-finding technique of Okano using the frame memory and drawing lines apparatus and the pixel-shifting and data extraction technique of Shimomae, motivated by the need to reduce the sequential memory accesses and latency of a general-purpose computer technique by using a hardware implementation so that the processing can meet real-time constraints (Benedetti, section 1 paragraphs 4 and 5). It would also have been obvious to one of

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ordinary skill in the art at the time the invention was made to replace the maximum-difference decision of Okano with the threshold comparison of Cleveland, motivated because "the spikes [from differentiating the smoothed intensity level across the eye image] are significantly easier to detect with an amplitude thresholding procedure" (Cleveland, col. 12 lines 3-5).

11. With respect to claim 3, Okano does not use the thresholding procedure disclosed by Cleveland, and so does not specify a threshold value. However, Cleveland discloses that "the threshold for detecting the pupil is generally set to a value about midway between the average iris intensity and the average pupil intensity" (col. 8 lines 23-25), a value which lies between  $\frac{1}{4}$  and 1 times the difference between the integrated (or averaged) value when an integrating circle is located on the iris versus the pupil.

An example from the prior art anticipates a range if it lies within that range (*Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985)).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the anticipated range when combining the device of Okano and Shimomae above with the thresholding procedure of Cleveland, for the same reasons discussed in the rejection of claim 1 above.

12. With respect to claim 5, Okano further discloses a pointer unit for indicating center coordinates of the plurality of concentric integrating circles (Fig. 1 #12, #15, and col. 5 lines 19-36 and col. 4 lines 24-31), by maintaining a counter synchronized with

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the shifting of the integrating circles across the image (deltaX and deltaY) (or with the shifting of the image past the drawing lines as disclosed by Shimomae above).

13. With respect to claims 9, 11, and 13, Okano discloses an iris authentication apparatus (abstract). The subsequent limitations were described in the rejections for claims 1, 3, and 5 above, and these claims are thus rejected for the same reasons given for claims 1, 3, and 5 above, respectively.

14. With respect to claim 17, the rationale for rejection of claims 1 and 3 are incorporated herein, and the following differences in scope between claim 3 and the present claim are noted:

“...the image data, in which an iris and a pupil are to be photographed...”

“...comparing the difference value to a ~~predetermined~~ threshold value...”

Okano discloses that an iris and pupil are to be photographed in the image data (abstract), but does not disclose comparison to a threshold value.

However, Cleveland discloses comparison to a threshold value (col. 8 lines 7-26), and furthermore, discloses that the threshold value should be adjusted to compensate for variations in the average intensities of the pupil and iris (col. 11 lines 28-33), thus comparing the difference value to (non-predetermined) threshold values.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Okano, Shimomae, and Cleveland, as described in claims 1 and 3 above, by varying the threshold value when



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needed, motivated by the need to compensate for variations in lighting conditions with eye movement or with uneven lighting (Cleveland, col. 11 lines 28-33).

15. With respect to claim 18, Okano discloses an iris authentication apparatus (abstract). The subsequent limitations were described in the rejections for claim 17 above, and this claim is thus rejected for the same reasons given for claim 17.

### ***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hirota, Y., U.S. Patent 5,412,489.

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barry Drennan whose telephone number is 571-270-7262. The examiner can normally be reached on Monday through Thursday and alternate Fridays from 8:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Abul Azad can be reached on 571-272-7599. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Barry Drennan/  
Examiner, Art Unit 4133

/ABUL AZAD/  
Supervisory Patent Examiner, Art  
Unit 4133

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